**SQL QUERIES**

**DataBase Design**

**Creating Database**

CREATE DATABASE sdg11;

USE sdg11;

**Creating Tables**

CREATE TABLE City (

city\_id INT PRIMARY KEY,

city\_name VARCHAR(255),

region VARCHAR(255),

population INT,

average\_income DECIMAL(10, 2)

);

CREATE TABLE Neighborhood (

neighborhood\_id INT PRIMARY KEY,

city\_id INT,

neighborhood\_name VARCHAR(255),

median\_rent DECIMAL(10, 2),

median\_home\_price DECIMAL(15, 2),

FOREIGN KEY (city\_id) REFERENCES City(city\_id)

);

CREATE TABLE Household (

household\_id INT PRIMARY KEY,

neighborhood\_id INT,

household\_income DECIMAL(10, 2),

house\_type VARCHAR(255),

number\_of\_members INT,

FOREIGN KEY (neighborhood\_id) REFERENCES Neighborhood(neighborhood\_id)

);

CREATE TABLE ZoningRegulation (

zoning\_id INT PRIMARY KEY,

neighborhood\_id INT,

zone\_type VARCHAR(255),

regulation\_description TEXT,

FOREIGN KEY (neighborhood\_id) REFERENCES Neighborhood(neighborhood\_id)

);

CREATE TABLE PublicHousingProgram (

program\_id INT PRIMARY KEY,

city\_id INT,

program\_name VARCHAR(255),

benefits TEXT,

eligibility\_criteria TEXT,

FOREIGN KEY (city\_id) REFERENCES City(city\_id)

);

**Insert Data into City Table**

INSERT INTO City (city\_id, city\_name, region, population, average\_income) VALUES

(1, 'Metro City', 'Region A', 5000000, 55000.00),

(2, 'Coastal City', 'Region B', 3000000, 48000.00),

(3, 'Mountain City', 'Region C', 1200000, 51000.00);

**Insert Data into Neighborhood Table**

INSERT INTO Neighborhood (neighborhood\_id, city\_id, neighborhood\_name, median\_rent, median\_home\_price) VALUES

(1, 1, 'Downtown', 1500.00, 350000.00),

(2, 1, 'Uptown', 1800.00, 400000.00),

(3, 1, 'Suburbia', 1200.00, 300000.00),

(4, 2, 'Beachside', 2000.00, 450000.00),

(5, 2, 'Old Town', 1400.00, 320000.00),

(6, 2, 'Hillside', 1300.00, 280000.00),

(7, 3, 'Valley', 1100.00, 250000.00),

(8, 3, 'Highland', 1700.00, 380000.00),

(9, 3, 'Forest', 1000.00, 220000.00);

**Insert Data into Household Table**

INSERT INTO Household (household\_id, neighborhood\_id, household\_income, house\_type, number\_of\_members) VALUES

(1, 1, 60000.00, 'Apartment', 3),

(2, 1, 75000.00, 'House', 4),

(3, 1, 50000.00, 'Apartment', 2),

(4, 2, 80000.00, 'House', 5),

(5, 2, 62000.00, 'Apartment', 2),

(6, 2, 55000.00, 'House', 3),

(7, 3, 70000.00, 'House', 4),

(8, 3, 48000.00, 'Apartment', 1),

(9, 3, 53000.00, 'House', 2),

(10, 4, 90000.00, 'House', 6),

(11, 4, 67000.00, 'Apartment', 3),

(12, 4, 59000.00, 'House', 4),

(13, 5, 64000.00, 'Apartment', 2),

(14, 5, 52000.00, 'House', 3),

(15, 5, 56000.00, 'Apartment', 1),

(16, 6, 61000.00, 'House', 3),

(17, 6, 53000.00, 'Apartment', 2),

(18, 6, 47000.00, 'House', 2),

(19, 7, 58000.00, 'Apartment', 3),

(20, 7, 49000.00, 'House', 4),

(21, 7, 45000.00, 'Apartment', 1),

(22, 8, 80000.00, 'House', 5),

(23, 8, 69000.00, 'Apartment', 3),

(24, 8, 72000.00, 'House', 4),

(25, 9, 46000.00, 'Apartment', 2),

(26, 9, 40000.00, 'House', 3),

(27, 9, 53000.00, 'Apartment', 1);

**Insert Data into ZoningRegulation Table**

INSERT INTO ZoningRegulation (zoning\_id, neighborhood\_id, zone\_type, regulation\_description) VALUES

(1, 1, 'Residential', 'High-density residential area with mixed-use buildings.'),

(2, 1, 'Commercial', 'Commercial zoning with retail stores on the ground floor.'),

(3, 2, 'Residential', 'Medium-density residential area with family homes.'),

(4, 3, 'Residential', 'Low-density residential area with single-family homes.'),

(5, 3, 'Commercial', 'Limited commercial zoning for small businesses.'),

(6, 4, 'Residential', 'High-density residential area near the beach.'),

(7, 4, 'Commercial', 'Commercial area with beachside shops and restaurants.'),

(8, 5, 'Residential', 'Medium-density residential area with historic homes.'),

(9, 6, 'Residential', 'Low-density residential area with hillside views.'),

(10, 7, 'Residential', 'Medium-density residential area in a valley.'),

(11, 8, 'Residential', 'High-density residential area with apartments.'),

(12, 9, 'Residential', 'Low-density residential area surrounded by forests.');

**Insert Data into PublicHousingProgram Table**

INSERT INTO PublicHousingProgram (program\_id, city\_id, program\_name, benefits, eligibility\_criteria) VALUES

(1, 1, 'Metro Affordable Housing', 'Subsidized rent for low-income families.', 'Income below $40,000.'),

(2, 1, 'Metro Housing Assistance', 'Financial aid for first-time homebuyers.', 'First-time homebuyers with income below $60,000.'),

(3, 2, 'Coastal Housing Support', 'Rent control and subsidies for long-term residents.', 'Long-term residents of 5+ years.'),

(4, 2, 'Coastal Rent Assistance', 'Assistance for low-income renters.', 'Income below $45,000.'),

(5, 3, 'Mountain Affordable Homes', 'Subsidized home loans for low-income families.', 'Income below $50,000.'),

(6, 3, 'Mountain Housing Vouchers', 'Rent vouchers for displaced families.', 'Families displaced by natural disasters.');

**More Data for Neighborhood Table**

INSERT INTO Neighborhood (neighborhood\_id, city\_id, neighborhood\_name, median\_rent, median\_home\_price) VALUES

(10, 1, 'Industrial Park', 1300.00, 260000.00),

(11, 1, 'Historic District', 1700.00, 410000.00),

(12, 1, 'Greenbelt', 1100.00, 240000.00),

(13, 2, 'Riverfront', 1900.00, 430000.00),

(14, 2, 'Garden District', 1450.00, 330000.00),

(15, 2, 'Midtown', 1600.00, 370000.00),

(16, 3, 'Downtown', 1800.00, 390000.00),

(17, 3, 'Riverside', 1350.00, 310000.00),

(18, 3, 'Lakeside', 1250.00, 290000.00);

**More Data for Household Table**

INSERT INTO Household (household\_id, neighborhood\_id, household\_income, house\_type, number\_of\_members) VALUES

(28, 10, 58000.00, 'House', 3),

(29, 10, 62000.00, 'Apartment', 2),

(30, 11, 72000.00, 'House', 4),

(31, 11, 78000.00, 'Apartment', 3),

(32, 12, 48000.00, 'House', 2),

(33, 12, 50000.00, 'Apartment', 1),

(34, 13, 82000.00, 'House', 5),

(35, 13, 67000.00, 'Apartment', 3),

(36, 14, 62000.00, 'House', 4),

(37, 14, 54000.00, 'Apartment', 2),

(38, 15, 75000.00, 'House', 3),

(39, 15, 68000.00, 'Apartment', 2),

(40, 16, 88000.00, 'House', 5),

(41, 16, 74000.00, 'Apartment', 3),

(42, 17, 64000.00, 'House', 4),

(43, 17, 52000.00, 'Apartment', 2),

(44, 18, 59000.00, 'House', 3),

(45, 18, 47000.00, 'Apartment', 2),

(46, 10, 62000.00, 'House', 4),

(47, 11, 73000.00, 'Apartment', 3),

(48, 12, 51000.00, 'House', 2),

(49, 13, 84000.00, 'Apartment', 3),

(50, 14, 57000.00, 'House', 4),

(51, 15, 77000.00, 'Apartment', 2),

(52, 16, 91000.00, 'House', 5),

(53, 17, 66000.00, 'Apartment', 3),

(54, 18, 60000.00, 'House', 4);

**More Data for ZoningRegulation Table**

INSERT INTO ZoningRegulation (zoning\_id, neighborhood\_id, zone\_type, regulation\_description) VALUES

(13, 10, 'Commercial', 'Commercial zone with light industrial buildings.'),

(14, 11, 'Residential', 'Historic district with preservation restrictions.'),

(15, 12, 'Residential', 'Greenbelt area with environmental protections.'),

(16, 13, 'Commercial', 'Riverfront zone with mixed-use development.'),

(17, 14, 'Residential', 'Garden district with low-density housing.'),

(18, 15, 'Commercial', 'Midtown area with high-rise buildings allowed.'),

(19, 16, 'Residential', 'Downtown area with high-density zoning.'),

(20, 17, 'Residential', 'Riverside area with moderate-density zoning.'),

(21, 18, 'Residential', 'Lakeside area with restrictions on building heights.');

**More Data for PublicHousingProgram Table**

INSERT INTO PublicHousingProgram (program\_id, city\_id, program\_name, benefits, eligibility\_criteria) VALUES

(7, 1, 'Metro Green Homes Initiative', 'Incentives for green building practices.', 'Income below $70,000, environmentally friendly designs.'),

(8, 2, 'Coastal Sustainable Living', 'Support for sustainable housing projects.', 'Income below $60,000, commitment to sustainability.'),

(9, 3, 'Mountain Eco-Friendly Housing', 'Subsidies for eco-friendly home improvements.', 'Income below $55,000, use of sustainable materials.');

**SQL Programming**

**Data Retrieval Queries**

**1. Retrieve All Cities and Their Average Income**

SELECT city\_name, region, population, average\_income

FROM City;

**2. Retrieve All Neighborhoods in a Specific City**

SELECT N.neighborhood\_name, N.median\_rent, N.median\_home\_price

FROM Neighborhood N

JOIN City C ON N.city\_id = C.city\_id

WHERE C.city\_name = 'Metro City';

**3. Retrieve Households with Income Below a Specific Threshold**

SELECT H.household\_id, H.household\_income, H.house\_type, N.neighborhood\_name

FROM Household H

JOIN Neighborhood N ON H.neighborhood\_id = N.neighborhood\_id

WHERE H.household\_income < 50000;

**4. Retrieve Zoning Regulations for a Specific Neighborhood**

SELECT Z.zone\_type, Z.regulation\_description

FROM ZoningRegulation Z

JOIN Neighborhood N ON Z.neighborhood\_id = N.neighborhood\_id

WHERE N.neighborhood\_name = 'Downtown';

**5. Retrieve All Public Housing Programs in a Specific City**

SELECT P.program\_name, P.benefits, P.eligibility\_criteria

FROM PublicHousingProgram P

JOIN City C ON P.city\_id = C.city\_id

WHERE C.city\_name = 'Coastal City';

**Data Analysis Queries**

**1. Average Rent in Each City**

SELECT C.city\_name, AVG(N.median\_rent) AS average\_rent

FROM Neighborhood N

JOIN City C ON N.city\_id = C.city\_id

GROUP BY C.city\_name;

**2. Percentage of Households with Income Below the City’s Average Income**

SELECT C.city\_name,

COUNT(H.household\_id) \* 100.0 / (SELECT COUNT(\*) FROM Household H2 WHERE H2.neighborhood\_id IN (SELECT N2.neighborhood\_id FROM Neighborhood N2 WHERE N2.city\_id = C.city\_id)) AS percentage\_below\_average\_income

FROM Household H

JOIN Neighborhood N ON H.neighborhood\_id = N.neighborhood\_id

JOIN City C ON N.city\_id = C.city\_id

WHERE H.household\_income < C.average\_income

GROUP BY C.city\_name;

**3. Identify Neighborhoods with Median Home Prices Above a Specific Threshold**

SELECT neighborhood\_name, median\_home\_price

FROM Neighborhood

WHERE median\_home\_price > 400000;

**4. Count of Households by House Type in Each Neighborhood**

SELECT N.neighborhood\_name, H.house\_type, COUNT(H.household\_id) AS number\_of\_households

FROM Household H

JOIN Neighborhood N ON H.neighborhood\_id = N.neighborhood\_id

GROUP BY N.neighborhood\_name, H.house\_type;

**5. Total Population Covered by Public Housing Programs in Each City**

SELECT C.city\_name, COUNT(DISTINCT H.household\_id) AS total\_population\_covered

FROM PublicHousingProgram P

JOIN City C ON P.city\_id = C.city\_id

JOIN Neighborhood N ON C.city\_id = N.city\_id

JOIN Household H ON N.neighborhood\_id = H.neighborhood\_id

WHERE H.household\_income < 50000

GROUP BY C.city\_name;